Remarks

Reconstruction and further examination are requested.

3. Disposition of the Claims

Claims 1-20 are pending in the application.

Claims 6-20 are withdrawn from consideration.

Claims 1-5 are rejected.

Claims 6-20 are subject to restriction and/or election requirement.

Claim 1 is currently amended, without prejudice or disclaimer.

Claim 1 is currently amended. Support for each amended or new claim is found in the as-filed specification. Appendix A contains an annotated copy of the amended and new claims and contains, between curly brackets ({...}), citations to specifically point out the support for any amendments made to the claims.

This amendment adds, changes and/or deletes one or more claims in this application. A detailed listing of each claim that is, or was, in the application, irrespective of whether or not the claim remains under examination in the application, is presented, with a status identifier.

The present amendment is believed allowable under 37 C.F.R. § 1.116(b)(2) (presenting one or more of the rejected claims in condition for allowance or in better form for consideration on appeal).

4. Amendments to the specification

The objection to the Abstract is maintained because it falls short of 50 words although it is less than 150 words as argued by the applicants. See 37 CFR 1.72(a) and MPEP § 606. Office action, p. 2. The present abstract avoids this issue. Thus, the objection should be withdrawn.

5. Anticipation Rejections

There are five anticipation rejections. Each is addressed under a separate header.

a. Lieber

Claims 1-5 are rejected under 35 U.S.C. § 102(b) as being anticipated by Lieber et al (US Pat. no. 5,897,945). According to the rejection, Lieber teaches the following:

> acicular nanorods with the formula $M^1{}_x,M^2{}_yO_z$, wherein the preferred binary oxides include Al_2O_3 and ZnO. [Lieber] teaches doped ZnO nanorods with the formula In:ZnO. The nanorods had a diameter of 1-200 nm and a length of 0.01-300 microns (Cl-2, Ln 43-51; Cl-3, Ln 27-53; Claims 7-10). ln^{3+} and $A1^{3+}$ as dopants meet the limitation of element having higher oxidation state than Zn (2+) in the claims. With regard to the conductivity in claims 1 and 3, the prior art composition is either same or substantially same as that claimed by the applicants, and identical compositions have identical properties. This is further ascertained over the teachings of Min Yan cited in flowing rejection-6 (Thesis, Northwestern University, Dec 2002). All the limitations of the instant claims

Office action, pp. 2-3, para. 1. This rejection is respectfully traversed.

The reference fails to describe a material that is *coated* as recited in the present claims. Thus, the reference fails to describe an embodiment of the present invention.

Furthermore, if the teachings of Lieber were modified, that modification would make Liber's invention unsatisfactory for Lieber's intended use. According to Lieber, the ideal metal oxide nanorods are single crystals and "consist of a single crystal domain." Lieber, col. 4, ll. 48-64 (explaining the criticality of a freshly etched surface of the single crystal substrate). Adding a coating would move Lieber's product away from a single crystal domain and would thus be against Lieber's teachings. Thus, there would be no reason to modify Lieber's single crystal domains with a coating.

b. Seeber

Claims 1-3 are rejected under 35 U.S.C. § 102(b) as being anticipated by Seeber et al (Mat. Sci. in Semicond. Processing, 1999 (2), 45-55). According to the rejection, the following applies:

> Seeber teaches transparent semiconducting ZnO-Al thin films prepared by spray pyrolysis containing nanosized ZnO:Al crystals with a optical transmission of >85% and adjustable resistivity between 2 and 100 ohms cm (0.5 - 0.01 mho cm) (Abstract;Pg-51,

> Tabl-2; Pg-54, Fig-8 and its description) that meets the limitation of nanomaterial composition in the claims.

Office action, p. 3, para. 3. This rejection is respectfully traversed.

The reference fails to describe a material that is *coated* as recited in the present claims. Thus, the reference fails to describe an embodiment of the present invention.

Furthermore, Seeber teaches that control of the spray parameters is necessary. Seeber, p. 55, col. 1, 1st para. under "5. Conclusion". If parameters were modified, then Seeber's teachings would not be a basis to predict the result, because this parameter would not be controlled. Adding a coating would move Seeber's process away from controlled process and would thus be against Seeber's teachings. Thus, there would be no reason to modify Seeber's process by introducing a coated product.

c. Takakura

Claims 1 and 4-5 are rejected under 35 U.S.C. § 102(b) as being anticipated by Takakura et al (Abstract, MRS Symposium, Fall 2000). The relevant part of the rejection reads as follows:

> Takakura et al teach the composition containing nanowires (~0.5 nm high and ~20 nm wide) and quantum dots of (Mn Zn) Ferrite. Mn (IV) meets the limitation of dopant element with oxidation state higher than that of Zn. With regard to the conductivity, the examiner takes official notice over Simonet et al (US 4,277,356; Cl-1, Ln Ln 25-35) that discloses a resistivity values of lower than 1000 ohms.cm for Mn-Zn Ferrites…."

Office action, p. 3, para. 4. This rejection is respectfully traversed.

The reference fails to describe a material that is *coated* as recited in the present claims. Thus, the reference fails to describe an embodiment of the present invention.

Furthermore, Takakura teaches heteroepitaxy of magnetic oxide thin films. Takakura, abs. Takakura seems to be pure research. Thus, there would be no reason to modify its teachings by introducing a *coated* product.

d. Fujishiro

Claims 1-5 are rejected under 35 U.S.C. § 102(a) as being anticipated by Fujishiro et al (Quantum confined Semiconductor nanostructures, MRS Symposium 737, Dec 2-5, 2002, Boston, MA). The relvant part of the rejection reads as follows:

> Fujishiro et al teach the composition of tube shaped A1(3+)-doped ZnO ceramics with a particle size of 100 nm in diameter and 500 nm in length, and having a DC conductivity of 0.1 Scm^{-1} at 50C that increases with the temperature (Pg-360, Fig-3A and its description; Pg-361, Fig-6; Pg-362, conclusion).

Office action, p. 3, para. 5. This rejection is respectfully traversed.

The reference fails to describe a material that is *coated* as recited in the present claims. Thus, the reference fails to describe an embodiment of the present invention.

Furthermore, Fujishiro teaches wet chemical precipitation of Al-doped ZnO. Fujishiro, abs. Fujishiro does not seem to concern *coated* products. Nor does its wet chemistry approach necessarily make *a particle size distribution (d_{99}) less than 100 nm* as recited in the present claims. Thus, there would be no reason to modify its teachings by introducing a *coated* product as recited in the present claims.

e. Yan

Claims 1-5 are rejected under 35 U.S.C. § 102(a) as being anticipated by Min Yan (Thesis, Northwestern University, Dec 2002). The relevant part of the rejection reads as follows: "Yan teaches the composition of Al doped ZnO nanorods with a diameter of 40 nm and having a conductivity of 70.02 S/cm (Pg-125)." Office action, p. 3, para. 7.

The reference fails to describe a material that is *coated* as recited in the present claims. Thus, the reference fails to describe an embodiment of the present invention.

Furthermore, Yan does not seem to concern *coated* products. Nor does its approach to making necessarily make *a particle size distribution (d_{99}) less than 100 nm* as recited in the present claims. Thus, there would be no reason to modify its teachings by introducing a *coated* product as recited in the present claims.

6. Obviousness rejection

There is one obviousness rejection.

a. Akhtar

Claims 1 and 3 are rejected under 35 U.S.C. § 103(a) as being obvious over Akhtar (US Pat. no. 5,089,248). According to the rejection, "Akhtar teaches the composition of B-doped Zn oxide with a particle size of 0.1-0.2 micron and a resistivity of 2x10 ohm.cm ((C1 3, Ln 37-41; Cl-4, Ln 10-13)." Office action, p. 3, para. 2. The present rejection is respectfully traversed, because it is believed that Akhtar's wet chemistry approach would not necessarily be sufficient to make *a particle size distribution* (d_{99}) *less than 100 nm* as recited in the present claims. Thus, this rejection should be withdrawn.

Conclusion

It is believed that the present application is in condition for allowance. Favorable reconsideration of the application is respectfully requested.

The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

If a petition for an extension of time is required, then one is requested. The Director is hereby authorized to charge any fees under 37 C.F.R. §§ 1.16-1.17 & 1.21(m) (including deficiencies in payment) which may be required, or credit any overpayment to Deposit Account No. 50-4028.

Respectfully submitted,

Dated: 2008-05-09

By:/Sean Allen Passino/

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Enclosure: Appendix A. Annotated copies of the currently amended and new claims.

7. Appendix A. Annotated copies of the currently amended and new claims.

Appendix A contains an annotated copy of the amended claims and new claims, and it contains, between curly brackets ({...}), citations to specifically point out the support for any amendments made to the claims. It is **not** meant to indicate instructions for amending the claims under 37 C.F.R. § 1.121.

1. (Currently Amended) A nanomaterial composition of matter comprising zinc; and at least one metal other than zinc, wherein the at least one metal comprises an element, that a) has an oxidation state higher than an oxidation state of zinc and b) dopes zinc in the nanomaterial composition, and wherein the composition of matter has an electrical conductivity greater than 0.0001 mhos.cm, wherein the nanomaterial composition of matter comprising zinc is coated **{para. 23, l. 5; para. 26, l. 3}**, and wherein the nanomaterial composition of matter comprising zinc has a particle size distribution (d_{99}) less than 100 nm **{para. 67, l. 5}**.